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Circular No. 6. S. 32.

United States Department of Agriculture,

DIVISION OF SOILS.

INSTRUCTIONS FOR DETERMINING IN THE FIELD THE SALT CONTENT OF ALKALI WATERS AND SOILS.

As many requests are being received for instructions as to the field standardization of the electrolytic bridge in determining the salt content of soils and waters, the following directions have been prepared to fully answer such inquiries. The electrolytic bridge itself and the method of using it have been described in Bulletin No. 15 of the Division of Soils.

The irrigation water, or the soil, the electrical resistance of which is to be found, is put into the hard rubber cell with metal electrodes. If the salt content of water is to be determined, the cell is filled even full with the water. If the salt content of soils is to be determined, the soil is made into the condition of a thin mortar with distilled water and the cell filled with this material, gently tapping the cell on the ground to exclude air bubbles. The top of the soil is then struck off with a knife edge so that the cell shall be just level full of the saturated soil. The cell is then suspended in the mercury cups attached to the electrolytic bridge and the electrical resistance determined in the following way:

The telephone receiver is pressed against the ear and the handle of the instrument pressed down, when a buzzing sound will be heard in the receiver. Holding the handle down so as to keep the battery switch closed, the pointer is rotated to either right or left until the position is found at which the note in the telephone receiver is no longer heard or is only indistinctly heard. On rotating the pointer to either side of this position, the sound in the receiver should gradually increase. In case difficulty is found in locating the exact position of balance, it will be found of assistance to rotate the pointer rapidly back and forth over the position of least sound, locating points of equal intensity on either side. The mean position between these two points gives the position of balance, and the number opposite the pointer gives the desired reading.

In case a balance is not obtained with the 1000-ohm coil of the rotary switch, the 100-ohm and 10-ohm coils should be tried in succession. It is best to choose the coil which will bring the balance as near as possible to the center of the scale, as this is the most sensitive position.

Having obtained the balance, the resistance is found by multiplying the resistance of the comparison coil, as shown by the rotating switch, by the number on the scale opposite the pointer. Thus, if the comparison coil used has a resistance of 100 ohms and the reading on the scale is 0.92, the resistance in the scale is 92 ohms. If the comparison coil is 1,000 ohms and the reading on the scale is 4.5, the resistance would be 4,500 ohms. After taking the resistance in this manner, take the temperature immediately, either of the water or of the saturated soil, by sticking the bulb of a thermometer in and leaving it for some moments. The resistance is then corrected for this temperature according to the directions given in the latter part of this circular.

DIRECTIONS FOR ESTIMATING THE SALT CONTENT OF IRRIGATION AND SEEPAGE WATERS IN THE FIELD.

The following table, giving the relation between the electrical resistance and the salt content of irrigation and seepage waters, is based upon the composition of the alkali of Salt Lake Valley, Utah.

Fill the electrolytic cell with water and take the resistance. Take the temperature with an ordinary thermometer and reduce to 60° F. by use of the table on page 8. The salt content corresponding to this resistance may be found from the following table:

Resistance and concentration of salt solution in Cell No. 1.

[Capacity 48 c. c., cell factor 3.53, based on composition of Utah alkali.]

Resistance at 60° F.	Parts per 100,000.	Resistance at 60° F.	Parts per 100,000.
Ohms.		*Ohms.*	
20	1,165	130	158
21	1,105	140	146
22	1,050	150	136
23	1,000	160	127
24	955	170	119
25	915	180	111
26	879	190	104
27	846	200	98
28	815	220	89
29	785	240	81
30	756	260	73
35	633	280	67
40	546	300	62
45	482	350	52
50	431	400	44
55	388	450	39
60	353	500	35
65	323	600	28
70	298	700	23
75	276	800	19
80	258	900	16
85	242	1,000	14
90	228	1,200	12
95	216	1,400	11
100	206	1,600	10
110	188	1,800	9
120	172	2,000	8

If there is any great difference between the composition of the salts to be examined and that of those occurring in Utah (from which the above table was made), there may be an error in the solutions having a concentration of 1 per cent, amounting to as much as 20 per cent of the salts present. In extremely dilute solutions there will be no error.

The electrolytic cells are made of as nearly the same dimensions as possible, but if there is much variation in either volume or shape this table could not be used without a correction for the cell.

If greater accuracy is desired than can be expected by the use of the above table, proceed in the following way:

Collect six or eight samples of water from different parts of the area; determine the electrical resistance of each, and take an amount of each proportional to the resistance, mixing them in a clean vessel. There should be at least two quarts, and preferably one gallon, of this mixture. Evaporate slowly on a stove until the mixture is about as strong as the strongest water likely to be encountered. If there is any possibility of encountering water as strong as a 1 per cent solution, that is, 1,000 parts of salts in 100,000 parts of water, the mixture should be evaporated until it gives a resistance in the cell of about 23 ohms. The amount of this evaporation can be determined by the original resistance of the mixture. If the resistance of the mixture is 100 ohms, it should be evaporated to one-fourth its volume to make approximately a 1 per cent solution. If the resistance is 400 ohms, the solution should be evaporated to one-twenty-third of its original volume. Water having a resistance of 400 ohms would have a salt content according to the above table of about 44 in 100,000, and would be considered an excellent water for irrigation purposes. It would require 3 gallons of such water, evaporated to one pint, to make a 1 per cent solution.

To determine the actual per cent of salt in this solution, after finding the resistance in the cell, evaporate in a weighed vessel—such as a tin cup or a tin can—a separate, weighed amount of the water. Weigh the vessel again after the evaporation, and this will give the amount of residue in a known weight of water. The weighing should be carefully done on reliable druggists' scales.

Take the concentrated solution and dilute with successive quantities of distilled water, so as to change the concentration of the solution and get the corresponding resistances in the cell. Use, for example, 9 parts of the solution and 1 part distilled water, then 8 parts of the solution and 2 parts of distilled water, and so on down to any dilution likely to be encountered. This will give the resistance corresponding very exactly with known amounts of salt, and will furnish a table for the estimation of the salt content from the resistance of any water in the area.

The table constructed from this data can be used directly by interpolation, or preferably a curve should be constructed and any intermediate points picked out from this.

The electrolytic cell should be kept free from grease or tarnish. It should be frequently scoured with silt or fine sand. The mercury connections should also occasionally be examined, as they are liable to become tarnished and indicate too high a resistance.

DIRECTIONS FOR MAPPING ALKALI SOILS IN THE FIELD.

The contour intervals for the alkali maps are to represent, respectively, .20, .40, .60, 1.00, 3.00 per cent of salt in the dry soil. The maps are to be constructed in the field directly from the resistances. The work is to be standardized in each district in the following way:

Take eight or ten crusts, including the top inch of soil, or if crusts can not be obtained take the strongest alkali soils from different places over the whole area. Fill a large cup or tumbler about one-third full with a crust or soil, using more or less according to the richness of the material, and nearly fill the tumbler with distilled water. Stir vigorously and allow it to subside for a short time. Treat the eight or ten crusts or soils in the same way. Determine the electrical resistance of the solutions in the cell. Take an amount of the strongest solution, equivalent to at least 200 c.c., having a resistance of 5 ohms, and add to it a volume of each of the others proportional to the resistances determined. This mixture, containing approximately equal quantities of salt from the eight or ten localities selected, is evaporated to dryness on a common range in a graniteware saucepan. Before the salts begin to crystallize out, and when the clay and organic matter are well flocculated, filter and evaporate the clear filtrate, stirring at the last to prevent caking. Gently heat the residue to drive off the water of crystallization of the sodium sulphate and sodium carbonate. If the original solution can not be filtered clear at any time before the salts begin to crystallize out, a second evaporation may be necessary.

A ten per cent solution should be made of this salt in distilled water. The electrical resistance of this ten per cent solution in any cell, divided by 0.24, will equal the resistance of sand or sandy loam in the same cell when completely saturated, and at a temperature of 60° F., when the soil contains 3.00 per cent of salt. This solution is then to be diluted and the resistance determined at various concentrations, corresponding to the limiting values of the soil map for four grades of soil. Ordinarily, a 3⅓ per cent solution is as concentrated as would be required, as this represents 1 per cent of salt in the soil.

The dilutions are as follows, the figures representing cubic centimeters of the 10 per cent solution to be diluted and made up to 100 cubic centimeters:

To obtain limiting values.

Salt in soil.	Volume of 10 per cent solution in 100 c.c.			
	s. and ssc.	sc.	scc.	c. and hc.
Per cent.	*c. c.*	*c. c.*	*c. c.*	*c. c.*
3.00	100.0	79.5	71.4	66.6
1.00	33.3	26.5	23.8	22.2
.60	20.0	15.9	14.3	13.3
.40	12.0	10.6	9.5	8.9
.20	6.0	5.3	4.8	4.4
Resistances to be reduced to 60° F. and divided by	.24	.275	.29	.30

NOTE.—"S. and ssc.", sand and sandy loam; "sc.", loam; "scc.", clay loam; "c. and hc.", clay and heavy clay soil.

The result will give the cell resistance at 60° F., corresponding to the limiting values to be inserted in the following table:

Table of limiting values.

Salt in soil.	s. and ssc.	sc.	scc.	c. and h.
Per cent.	*ohms.*	*ohms.*	*ohms.*	*ohms.*
3.00	....	....	....	....
1.00	....	....	....	....
.60	....	....	....	....
.40	....	....	....	....
.20	....	....	....	....

To correct for any lime sulphate which does not redissolve, take the resistance of the solution before evaporating. Then evaporate in a separate vessel a measured portion, such as 100 c. c., heat the residue to char the organic matter, dissolve, make up to the same volume as before, and take the resistance. Any difference in resistance will be considered due to salts having gone out of solution, and all resistances used in the limiting values are to be decreased by the proportional increase in resistance so found before being entered in the table; or the weight of salt for the 10 per cent solution may be increased in proportion to the difference in resistance.

DIRECTIONS FOR ESTIMATING SODIUM CARBONATE AND CHLORIDS IN SOILS.

Take a known volume (or weight) of saturated soil, wash into a 250 c. c. flask and fill to the mark with distilled water. After shaking well, take 50 c. c. of the solution (a slight turbidity will not matter) and titrate with $\frac{N}{10}$ acid potassium sulphate, using phenolphthalein as an indicator. Then to the same solution add a few drops of potassium chromate as an indicator and titrate with $\frac{N}{10}$ silver nitrate.

One cc. $\frac{N}{10}$ Na_2CO_3 = .005266 grams Na_2CO_3.

One cc. $\frac{N}{10}$ NaCl = .005806 NaCl.

Construct the sodium carbonate map in the field from the volume of solution used. Limiting values will be .3, .2, .1, .05 per cent of dry soil. The limiting values for each vessel are found in the following way: Multiply the volume of saturated soil, represented by the solution taken for titration, by the numbers in the following table:

Na_2CO_3 in soil.	s. and ssc.	sc.	scc.	c. and hc.
Per cent.				
.30	.832	.752	.720	.689
.20	.454	.502	.480	.459
.10	.277	.251	.240	.230
.05	.138	.125	.120	.115

The results so obtained are the cubic centimeters of $\frac{N}{10}$ solution of sodium carbonate corresponding to the limiting values to be inserted in the following table:

Na_2CO_3 in soil.	s. and ssc.	sc.	scc.	c. and hc.
Per cent.	cc.	cc.	cc.	cc.
.30	....	....	....	....
.20	....	....	....	....
.10	....	....	....	....
.05	....	....	....	....

If it is desired to reduce the volume of $\frac{N}{10}$ $AgNO_3$ to per cent of NaCl in dry soil the following formula may be used:

$$\frac{V \times .005806}{V' K}$$

V = cc. $\frac{N}{10}$ $AgNO_3$ solution used; V′ = volume saturated soil represented in amount of solution titrated; K = constant for type of soil as follows:

s. and ssc. = 1.46; sc. = 1.32; scc. = 1.26; c. and hc. = 1.21.

REDUCTION OF ELECTRICAL RESISTANCES TO A UNIFORM TEMPERATURE.

A single illustration will serve to show the way the following table is used in the reduction of electrical resistances to a uniform temperature of 60° F. Suppose the observed resistance of the soil is 2,585 ohms at a temperature of 50.5°. In the table at the temperature of 50.5°, as indicated on the left-hand side, we find that at that temperature 2,000 ohms is equal to 1,748 ohms at 60°; 5,000 ohms is equal to 4,370 ohms at 60°; hence, 500 ohms would be equal to 437 ohms. Similarly, 80 ohms would be one-hundredth of the value given for 8,000 ohms at 50.5° in the table, therefore equal to about 70 ohms at 60°, while the 5 ohms would be equal to about 4 ohms. These separate values are added together thus:

2,000	1,748
500	437
80	70
5	4

2,585 ohms at 50.5° = 2,259 ohms at 60°.

Respectfully submitted.

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Approved:
JAMES WILSON,
Secretary of Agriculture.

WASHINGTON, D. C., *March 7, 1900.*

Reduction of the electrical resistance of soils to a uniform temperature of 60° F.

°F.	1000	2000	3000	4000	5000	6000	7000	8000	9000
32.0	625	1,250	1,875	2,500	3,125	3,750	4,375	5,000	5,625
32.5	632	1,265	1,897	2,530	3,163	3,795	4,425	5,059	5,691
33.0	640	1,280	1,920	2,560	3,200	3,840	4,480	5,120	5,760
33.5	647	1,294	1,941	2,588	3,235	3,883	4,530	5,177	5,824
34.0	653	1,306	1,959	2,612	3,265	3,918	4,571	5,224	5,877
34.5	660	1,320	1,980	2,640	3,300	3,960	4,620	5,280	5,940
35.0	668	1,336	2,004	2,672	3,340	4,008	4,676	5,344	6,012
35.5	675	1,350	2,025	2,700	3,375	4,050	4,725	5,400	6,075
36.0	683	1,366	2,049	2,732	3,415	4,098	4,781	5,464	6,147
36.5	690	1,380	2,070	2,760	3,450	4,140	4,830	5,520	6,210
37.0	698	1,396	2,094	2,792	3,490	4,188	4,886	5,584	6,282
37.5	704	1,408	2,112	2,816	3,520	4,224	4,928	5,632	6,336
38.0	711	1,422	2,133	2,844	3,555	4,266	4,977	5,688	6,399
38.5	717	1,434	2,151	2,868	3,585	4,302	5,019	5,736	6,453
39.0	723	1,446	2,169	2,892	3,615	4,338	5,061	5,784	6,507
39.5	729	1,458	2,187	2,916	3,645	4,374	5,103	5,832	6,561
40.0	735	1,470	2,205	2,940	3,675	4,410	5,145	5,880	6,615
40.5	742	1,484	2,226	2,968	3,710	4,452	5,194	5,936	6,678
41.0	750	1,500	2,250	3,000	3,750	4,500	5,250	6,000	6,750
41.5	757	1,514	2,271	3,028	3,785	4,542	5,299	6,056	6,813
42.0	763	1,526	2,289	3,052	3,815	4,578	5,341	6,104	6,867
42.5	770	1,540	2,310	3,080	3,850	4,620	5,390	6,160	6,930
43.0	776	1,552	2,328	3,104	3,880	4,656	5,432	6,208	6,984
43.5	782	1,564	2,346	3,128	3,910	4,692	5,474	6,256	7,038
44.0	788	1,576	2,364	3,152	3,940	4,728	5,516	6,304	7,092
44.5	794	1,588	2,382	3,176	3,970	4,764	5,558	6,352	7,146
45.0	800	1,600	2,400	3,200	4,000	4,800	5,600	6,400	7,200
45.5	807	1,614	2,421	3,228	4,035	4,842	5,649	6,456	7,263
46.0	814	1,628	2,442	3,256	4,070	4,884	5,698	6,512	7,326
46.5	821	1,642	2,463	3,284	4,105	4,926	5,747	6,568	7,389
47.0	828	1,656	2,484	3,312	4,140	4,968	5,796	6,624	7,452
47.5	835	1,670	2,505	3,340	4,175	5,010	5,845	6,680	7,515
48.0	843	1,686	2,529	3,372	4,215	5,058	5,901	6,744	7,587
48.5	850	1,700	2,550	3,400	4,250	5,100	5,950	6,800	7,650
49.0	856	1,712	2,568	3,424	4,280	5,136	5,992	6,848	7,704
49.5	862	1,724	2,586	3,448	4,310	5,172	6,034	6,896	7,758
50.0	867	1,734	2,601	3,468	4,335	5,202	6,069	6,936	7,803
50.5	874	1,748	2,622	3,496	4,370	5,244	6,118	6,992	7,866
51.0	881	1,762	2,643	3,524	4,405	5,286	6,167	7,048	7,929
51.5	887	1,774	2,661	3,548	4,435	5,322	6,209	7,096	7,983
52.0	893	1,786	2,679	3,572	4,465	5,358	6,251	7,144	8,037
52.5	900	1,800	2,700	3,600	4,500	5,400	6,300	7,200	8,100
53.0	906	1,812	2,718	3,624	4,530	5,436	6,342	7,248	8,154
53.5	912	1,824	2,736	3,648	4,560	5,472	6,384	7,296	8,208
54.0	917	1,834	2,751	3,668	4,585	5,502	6,419	7,336	8,253
54.5	925	1,850	2,775	3,700	4,625	5,550	6,475	7,400	8,325
55.0	933	1,866	2,799	3,732	4,665	5,598	6,531	7,464	8,397
55.5	940	1,880	2,820	3,760	4,700	5,640	6,580	7,526	8,460
56.0	947	1,894	2,841	3,780	4,735	5,682	6,629	7,576	8,523
56.5	954	1,908	2,862	3,816	4,770	5,724	6,678	7,632	8,586
57.0	961	1,922	2,883	3,844	4,805	5,766	6,727	7,688	8,649
57.5	968	1,936	2,904	3,872	4,839	5,807	6,775	7,743	8,711
58.0	974	1,948	2,922	3,896	4,870	5,844	6,818	7,792	8,766
58.5	981	1,961	2,942	3,923	4,903	5,884	6,864	7,845	8,826
59.0	987	1,974	2,962	3,949	4,936	5,923	6,910	7,898	8,885
59.5	994	1,988	2,982	3,976	4,971	5,965	6,959	7,953	8,947
60.0	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000
60.5	1,006	2,013	3,019	4,026	5,032	6,039	7,045	8,052	9,059
61.0	1,013	2,026	3,039	4,052	5,065	6,078	7,091	8,104	9,117
61.5	1,020	2,040	3,060	4,080	5,100	6,120	7,140	8,160	9,180
62.0	1,027	2,054	3,081	4,108	5,135	6,162	7,189	8,216	9,243
62.5	1,033	2,067	3,100	4,134	5,167	6,201	7,234	8,268	9,302
63.0	1,040	2,080	3,120	4,160	5,200	6,240	7,280	8,320	9,360
63.5	1,047	2,094	3,141	4,188	5,235	6,282	7,329	8,376	9,423
64.0	1,054	2,108	3,162	4,216	5,270	6,324	7,378	8,432	9,486
64.5	1,060	2,121	3,181	4,242	5,302	6,363	7,423	8,484	6,545
65.0	1,067	2,134	3,201	4,268	5,335	6,402	7,469	8,536	9,603
65.5	1,074	2,148	3,222	4,296	5,370	6,444	7,518	8,592	9,666

Reduction of the electrical resistance of soils, etc.—Continued.

°F.	1000	2000	3000	4000	5000	6000	7000	8000	9000
66.0	1,081	2,162	3,243	4,324	5,405	6,486	7,567	8,648	9,729
66.5	1,088	2,176	3,264	4,352	5,440	6,528	7,616	8,704	9,792
67.0	1,095	2,190	3,285	4,380	5,475	6,570	7,665	8,760	9,855
67.5	1,102	2,205	3,307	4,410	5,512	6,615	7,717	8,820	9,922
68.0	1,110	2,220	3,330	4,440	5,550	6,660	7,770	8,880	9,990
68.5	1,117	2,235	3,352	4,470	5,587	6,705	7,823	8,940	10,058
69.0	1,125	2,250	3,375	4,500	5,625	6,750	7,875	9,000	10,125
69.5	1,133	3,265	3,398	4,530	5,663	6,795	7,928	9,060	10,193
70.0	1,140	2,280	3,420	4,560	5,700	6,840	7,980	9,120	10,260
70.5	1,147	2,295	3,442	4,590	5,737	6,885	8,032	9,180	10,327
71.0	1,155	2,310	3,465	4,620	5,775	6,930	8,085	9,240	10,395
71.5	1,162	2,325	3,487	4,650	5.812	6,975	8,137	9,300	10,462
72.0	1,170	2,340	3,510	4,680	5,850	7,028	8,190	9,360	10,530
72.5	1,177	2,355	3,532	4,710	5,887	7,065	8,242	9,420	10,597
73.0	1,185	2,370	3,555	4,740	5,925	7,110	8,295	9,480	10,665
73.5	1,193	2,386	3,579	4,772	5,965	7,158	8,351	9,544	10,737
74.0	1,201	2,402	3,603	4,804	6,005	7,206	8,407	9,608	10,809
74.5	1,208	2,416	3,624	4,832	6,040	7,248	8,456	9,664	10,872
75.0	1,215	2,430	3,645	4,860	6,075	7,290	8,505	9,720	10,935
75.5	1,222	2,445	3,667	4,890	6,112	7,335	8,557	9,780	11,002
76.0	1,230	2,460	3,690	4,920	6,158	7,380	8,610	9,840	11,070
76.5	1,237	2,475	3,712	4,950	6,187	7,425	8,662	9,900	11,137
77.0	1,245	2,490	3,735	4,980	6,225	7,470	8,715	9,960	11,205
77.5	1,253	2,506	3,759	5,012	6,265	7,518	8,771	10,024	11,277
78.0	1,261	2,522	3,783	5,044	6,305	7,566	8,827	10,088	11,349
78.5	1,269	2,538	3,807	5,076	6,345	7,614	8,883	10,152	11,421
79.0	1,277	2,554	3,831	5,108	6,385	7,662	8,939	10,216	11,493
79.5	1,285	2,576	3,856	5,142	6,427	7,713	8,998	10,284	11,569
80.0	1,294	2,598	3,882	5,176	6,470	7,754	9,058	10,352	11,646
80.5	1,302	2,609	3,906	5,208	6,510	7,812	9,114	10,416	11,718
81.0	1,310	2,620	3,930	5,240	6,550	7,860	9,170	10,480	11,790
81.5	1,318	2,637	3,955	5,274	6,592	7,911	9,229	10,546	11,866
82.0	1,327	2,654	3,981	5,308	6,635	7,962	9,289	10,616	11,943
82.5	1,335	2,670	4,005	5,340	6,675	8,010	9,345	10,680	12,015
83.0	1,343	2,686	4,029	5,372	6,715	8,058	9,401	10,744	12,087
83.5	1,351	2,702	4,053	5,404	6,755	8,106	9,457	10,808	12,159
84.0	1,359	2,718	4,077	5,436	6,795	8,154	9,513	10,872	12,231
84.5	1,367	2,735	4,102	5,470	6,837	8,205	9,572	10,940	12,307
85.0	1,376	2,752	4,128	5,504	6,880	8,256	9,632	11,008	12,384
85.5	1,385	2,769	4,153	5,538	6,922	8,307	9,691	11,076	12,460
86.0	1,393	2,786	4,179	5,572	6,965	8,358	9,751	11,144	12,537
86.5	1,401	2,802	4,203	5,604	7,005	8,406	9,807	11,208	12,609
87.0	1,409	2,818	4,227	5,636	7,045	8,454	9,863	11,272	12,681
87.5	1,418	2,836	4,254	5,672	7,090	8,508	9,931	11,344	12,762
88.0	1,427	2,854	4,281	5,708	7,135	8,562	9,989	11,416	12,843
88.5	1,435	2,870	4,305	5,740	7,175	8,610	10,040	11,480	12,915
89.0	1,443	2,886	4,329	5,772	7,215	8,658	10,091	11,544	12,987
89.5	1,451	2,903	4,354	5,806	7,257	8,709	10,155	11,612	13,063
90.0	1,460	2,920	4,380	5,840	7,300	8,760	10,220	11,680	13,140
90.5	1,468	2,937	4,405	5,874	7,342	8,811	10,279	11,748	13,216
91.0	1,477	2,954	4,431	5,908	7,385	8,462	10,339	11,816	13,293
91.5	1,486	2,972	4,458	5,944	7,430	8,916	10,402	11,888	13,374
92.0	1,495	2,990	4,485	5,980	7,475	8,970	10,465	11,960	13,455
92.5	1,504	3,008	4,512	6,016	7,520	9,024	10,528	12,032	13,536
93.0	1,513	3,026	4,539	6,052	7,565	9,078	10,591	12,104	13,617
93.5	1,522	3,035	4,567	6,090	7,612	9,135	10,657	12,180	13,702
94.0	1,532	3,064	4,596	6,128	7,660	9,192	10,724	12,256	13,788
94.5	1,541	3,083	4,624	6,166	7,707	9,249	10,790	12,332	13,873
95.0	1,551	3,102	4,653	6,204	7,755	9,306	10,857	12,408	13,959
95.5	1,560	3,121	4,681	6,242	7,802	9,363	10,923	12,484	14,040
96.0	1,570	3,140	4,710	6,280	7,850	9,420	10,990	12,560	14,130
96.5	1,580	3,160	4,740	6,320	7,900	9,480	11,060	12,640	14,220
97.0	1,590	3,180	4,770	6,360	7,950	9,540	11,130	12,720	14,310
97.5	1,600	3,201	4,801	6,402	8,002	9,603	11,203	12,804	14,404
98.0	1,611	3,222	4,833	6,444	8,055	9,666	11,277	12,888	14,499
98.5	1,620	3,240	4,860	6,480	8,100	9,720	11,340	12,960	14,580
99.0	1,629	3,258	4,887	6,516	8,145	9,774	11,403	13,032	14,661